

CLAIMS:

I claim

1. A RAID data storage system comprising:
greater than one controller,
5 a multiplicity of direct access storage devices,
the direct access storage devices arranged in one or more channels,
each channel comprising a multiplicity of direct access storage devices,
the direct access storage devices mounted on one or more chassis,
each controller electrically connected to each direct access storage device of each channel
10 by a connector,
each controller having a backplane component electrically connected to the electronic
components of the controller,
the backplane of each controller a component of only one controller,
each chassis of direct access storage devices having a backplane component electrically
15 connected to each of the direct access storage devices by a connector, and
the backplane of each channel of direct access storage devices a component of only one
channel of direct access storage devices.
2. The RAID system of claim 1 wherein the connector is a wire, copper wire, cable,
optical fiber, or a SCSI bus.
20 3. The RAID system of claim 1 wherein the connector is a cable.
4. The RAID system of claim 1 wherein the direct access storage device is a tape, a
disk, or a CD.

5. The RAID system of claim 1 wherein the direct access storage device is a disk.

6. The RAID system of claim 5 wherein each disk is dual-ported.

7. The RAID system of claim 1 further comprising a power supply component and a cooling system component for each controller chassis, each power supply and cooling system a component of only one controller chassis.

8. The RAID system of claim 1 further comprising a power supply and a cooling system component for each chassis of direct access storage devices, each power supply and cooling system a component of only one chassis of direct access storage devices.

9. The RAID system of claim 1 wherein each controller is mounted in a controller chassis, each controller chassis having mounted in it only one controller.

10. The RAID system of claim 1 wherein a channel of direct access storage devices is mounted in a single channel chassis, the channel chassis having mounted in it only one channel of direct access storage devices.

11. The RAID system of claim 1 wherein a channel of direct access storage devices comprises direct access storage devices mounted on greater than one chassis.

12. The RAID system of claim 1 wherein data parity groups are extended over a multiplicity of channels so that no more than one data bit of a data parity group is stored in any channel.

13. The RAID system of claim 1 further comprising a rack,
the rack comprised of vertical and horizontal elements,
the horizontal elements arrayed between and supported by the vertical elements,
each horizontal element supporting either a controller chassis or a direct access storage

device chassis.

14. A RAID data storage system comprising:

a first and a second controller,

two or more channels of dual-ported disks,

each channel comprising five dual-ported disks,

each controller having a backplane component electrically connected to the electronic components of the controller,

each channel of disks having a backplane component electrically connected to each of the disks,

a separate cable attaching each disk in a channel to a controller,

a first port of each disk electrically connected to the first controller, and a second port of each disk electrically connected to the second controller, wherein

the backplane of each controller is a component of only one controller, and

the backplane of each channel of disks is a component of only one channel of disks.

15. A RAID system comprising:

greater than one controller modules, each controller module comprising a controller, a backplane, a power supply, and a cooling system,

and a multiplicity of direct access storage device modules, each direct access storage device module comprising a multiplicity of direct access storage devices, a backplane, a power supply, and a cooling system,

each controller module electrically connected by a connector module to each direct access storage device module,

the RAID data storage system capable of function despite the failure of any one module.

16. A RAID data storage system comprising:

greater than one controller,

each controller mounted on a controller chassis,

each controller chassis having only one controller mounted thereon,

a multiplicity of direct access storage devices,

the direct access storage devices arranged in one or more channels,

each channel comprising a multiplicity of direct access storage devices,

the direct access storage devices of each channel mounted on one or more chassis, and

each controller electrically connected to each direct access storage device of each channel

by a connector.

17. The RAID system of claim 16 wherein the connector is a wire, copper wire, cable, optical fiber, or a SCSI bus.

18. The RAID system of claim 16 wherein the connector is a cable.

19. The RAID system of claim 16 wherein the direct access storage device is a tape, a disk, or a CD.

20. The RAID system of claim 16 wherein the direct access storage device is a disk.

21. The RAID system of claim 20 wherein each disk is dual-ported.

22. The RAID system of claim 16 further comprising a power supply and a cooling system component mounted in each controller chassis, each power supply and cooling system a component of only one controller chassis.

23. The RAID system of claim 16 further comprising a power supply and a cooling

system component for each chassis of direct access storage devices, each power supply and cooling system a component of only one chassis of direct access storage devices.

24. The RAID system of claim 16 wherein a channel of direct access storage devices is mounted in only one chassis.

25. The RAID system of claim 16 wherein a channel of direct access storage devices is mounted in greater than one chassis.

26. The RAID system of claim 16 wherein data parity groups are extended over a multiplicity of channels so that no more than one data bit of a data parity group is stored in any channel.

27. The RAID system of claim 16 further comprising a rack,
the rack comprised of vertical and horizontal elements,
the horizontal elements arrayed between and supported by the vertical elements,
each horizontal element supporting either a controller chassis or a direct access storage device chassis.

SEQUENCE LISTING

Not applicable.